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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,072	08/23/2006	Markus Christoph	11336.1238 (P03036US)	3659
757 BRINKS HOFER GILSON & LIONE P.O. BOX 10395 CHICAGO, IL 60610			EXAMINER PAUL, DISLER	
			ART UNIT 2615	PAPER NUMBER
			MAIL DATE 01/31/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,072	CHRISTOPH, MARKUS	
	Examiner	Art Unit	
	Disler Paul	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/29/05</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6, 9, 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1).

Re claim 1, Marash et al. disclose of the system for use comprising a microphone array with at least two microphones (fig.1-2 wt (10,26); col.4 line 6-67 & col.7 line 1-4) and a signal processing means characterized in that the signal processing means comprises a superdirective beamformer with fixed superdirective filters (col.12 line 5-10; col.3 line 15-26; fig.1-2 (36); col.7 line 15-27).

While, Marash et al. disclose of the above, However, Marash et al. fail to disclose of the specific wherein the system being a handsfree system for use in a vehicle. But, Schaaf disclose of a system wherein being a handsfree system for use in a vehicle (fig.1-2; col.3 line 25-32; col.1 line 13-17) for purpose of enabling the user to communicate freely without disturbing its current task. Thus, taking the combined teaching of Marash et al. and Schaaf as a whole, it would

have been obvious for one of the ordinary skill in the art at the time of the invention to have modify Marash et al. by incorporating the handsfree system for use in a vehicle for purpose of enabling the user to communicate freely without disturbing its current task.

Re claim 2, the handsfree system according to claim 1 where the beamformer is a regularized superdirective beamformer using a finite regularization parameter (col.7 line 30-45; col.10 line 1-5).

Re claim 3, the handsfree system according to claim 2 where the finite regularization parameter p comprises a finite regularization parameter p depending on the frequency (col.7 line 30-45 col.10 eq(23))

4. Handsfree system according to claim 1 where each superdirective filter results from an iterative design based on a predetermined maximum susceptibility (fig.2 wt (66) for optimal output predetermined fixed beamform, repeatd, col.7 line 10-27).

Re claim 5, the Handsfree system according to claim 1 where each superdirective filter comprises a filter in the time domain (col.6 line 45-47; col.5 line 8-10/filters converted to time domain).

Re claim 6, the Handsfree system according to claim 1 where the signal processing means further comprises at least one inverse filter for adjusting a microphone transfer function (col.6 line 55-62).

Re claim 9, the Handsfree system according to claim 6, where each inverse filter is combined with a superdirective filter of the beamformer (col.6 line 57-59/weight of each filter to inverse).

Re claim 20, the Handsfree system according to claim 1 where at least one microphone comprises a directional microphone (col.5 line 15-16).

Re claim 21, the Handsfree system according to claim 20 where the directional microphone comprises a directional microphone with a cardioid characteristic (col.11 line 57-62).

Re claim 22, the Handsfree system according to claim 20 where the directional microphone comprises a differential microphone (col.11 line 59-61/uni-mics with mismatched output).

Re claim 18, the Handsfree system according to claim 1, comprising a frame where each microphone of the microphone array is arranged in a predetermined, position in or on the frame (schaaf, col.3 line 25-38).

Re claim 19, the Handsfree system according to claim 18 where the predetermined position comprises a fixed position in or on the frame (see claim 18 rejection).

Re claim 23, the Handsfree system according to claim 1 comprising a vehicle coupled to the microphone and the beamformer (Schaaf, col.1 line 12-6; fig.2/beam microphones for used in vehicle).

3. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1) and further in view of Abel (US 5,659,619).

Re claim 7, the Handsfree system according to claim 6 with the inverse filter, But the combined teaching of Marash et al. and Schaaf as a whole, fail to disclose of the at least one inverse filter comprises a warped inverse filter. But, Abel disclose of a system with frequency response wherein the at least one inverse filter comprises a warped inverse filter (fig.7 wt (129); col.8 line 47-54) for the purpose of reducing the complexity or length of the transfer function.

4. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1) and further in view of Lavoie et al. (US 7,158,643 B2).

Re claim 8, the Handsfree system according to claim 6, However, the combined teaching of Marash and Schaaf as a whole, fail to disclose of the where each inverse filter comprises an approximate inverse of a non-minimum phase filter. But, Lavoie et al. disclose of a system wherein the inverse filter comprises an approximate inverse of a non-minimum phase filter (col.8 line 30-36; col.11 line 30-35) for the purpose of creating a stable filter for infinite response. Thus, taking the combined teaching of Marash and Schaaf and Lavoie et al. as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify the combined teaching of Marash and Schaaf as a whole, by incorporating the inverse filter comprises an approximate inverse of a non-minimum phase filter for the purpose of creating a stable filter for infinite response.

5. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1) and further in view of Brennan et al. (US 2003/0063759).

Re claim 12, the Handsfree system according to claim 1 with the array microphone, However, the combined teaching of Marash et al. and Schaaf as a whole, fail to disclose of the where the configuration of

the microphone array comprises at least two microphones arranged in an endfire orientation with respect to a first position. But, Brenman et al. disclose of a fixed beamforming system wherein the configuration of the microphone array comprises at least two microphones arranged in an endfire orientation with respect to a position (fig.3; [0006,0009]) for the purpose of providing constant directivity regardless of the movement of the source. Thus, taking the combined teaching of Marash et al. and Schaaf and now Brennan et al. as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify the combined teaching of Marash et al. and Schaaf as a whole, by incorporating the the configuration of the microphone array comprises at least two microphones arranged in an endfire orientation with respect to a position for the purpose of providing constant directivity regardless of the movement of the source.

Re claim 13, the Handsfree system according to claim 12, with the two microphone array in endfire orientation to a position, the combined teaching of Marash et al. and Schaaf and now Brennan et al. as a whole, would have further incorporate of the microphone array arranged with endfire orientation with respect to a second position (Schaaf, col.4 line 45-52/orientation for all the plurality of persons in vehicle).

Re claim 15, the combined teaching of Marash et al. and Schaaf and now Brennan et al. as a whole, disclose of the Handsfree system according to claim 13, with the at least two microphones in the first endfire orientation and the at least two microphones in the second endfire orientation (see claim 13 explanation), However, the combined teaching of Marash et al. and Schaaf and now Brennan et al. as a whole, fail to disclose of the specific wherein the endfire microphone orientations comprise a microphone in common. However, official notice is taken the concept of having a common microphone in each endfire location is commonly known in the art, thus official notice is taken it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify the Marash et al. and Schaaf and now Brennan et al. as a whole, by incorporating the specific with the concept of having a common microphone in each endfire location for providing excellent directivity with fewer microphones.

6. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1) and further in view of Iwahara et al. (US 4,696,043).

Re claim 16, the Handsfree system according to claim 1 with the array microphones, However, the combined teaching of Marash et al. and

Schaaf as a whole, fail to disclose of the where the microphone array comprises at least two subarrays. However, Iwahara et al. disclose of an array of microphone wherein the microphone array comprises at least two subarrays (fig.1,11; col.2 line 50-65) for the purpose of easily realizing sharpness on the microphones. Thus, taking the combined teaching of Marash et al. and Schaaf and Iwahara et al. as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify the combined teaching of Marash et al. and Schaaf as a whole, by incorporating the microphone array comprises at least two subarrays for the purpose of easily realizing sharpness on the microphones.

Re claim 17, the Handsfree system according to claim 16 where at least two subarrays comprise at least one microphone in common (col.2 line 61/all microphone may be omnidirectional).

7. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1) and further in view of Kanazawa et al. (US 6,339,758 B1).

Re claim 10, the Handsfree system according to claim 1, However, the combined teaching of Marash et al. and Schaaf as a whole, fail to disclose where the beamformer comprises the structure of a generalized

sidelobe canceller. But, Kanazawa et al. disclose of a system wherein the beamformer comprises the structure of a generalized sidelobe canceller (fig.2a, col.1 line 15-30) for the purpose of improving processing speed during operation. Thus, taking the combined teaching of Marash et al. and Schaaf and Kanazawa et al. as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify the combined teaching of Marash et al. and Schaaf as a whole, by incorporating the beamformer comprises the structure of a generalized sidelobe canceller for the purpose of improving processing speed during operation.

8. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marash et al. (US 6,594,367) and Schaaf (US 6,748,088 B1).

Re claim 11, the Handsfree system according to claim 1 with the beamformer, However, the combined teaching of Marash et al. and Schaaf as a whole, fail to disclose of the where the beamformer comprises a minimum variance distortionless response (MVDR) beamformer. However, the concept of having a beamformer being the specific type of minimum variance distortionless response (MVDR) beamformer is commonly known in the art, thus official notice is taken it would have been obvious to have modify the combined teaching of Marash et al. and Schaaf as a whole, by incorporating the beamformer being the specific type of minimum variance distortionless response (MVDR) beamformer for the

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purpose of enhancing the sound directivity in the known particular location.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Disler Paul whose telephone number is 571-270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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